A. Enter Available Site-Specific Values

Land Application Unit (Figure 5.24)

For LAUs, site-specific values for the following parameters may be entered:

- Area of the LAU *(required)*
- Distance to nearest well *(optional; default = 150 m)*
- Operational life of the LAU *(optional; default = 40 yrs)*

Landfill (Figure 5.25)

For LFs, site-specific values for the following parameters may be entered:

- Area of the LF *(required)*
- Distance to nearest well *(optional; default = 150 m)*
- Depth of the LF *(required)*
- Depth of the LF base below ground surface *(optional; default = 0 m)*

Surface Impoundment (Figure 5.26)

For SIs, site-specific values for the following parameters may be entered:

- Area of the SI *(required)*
- Distance to nearest well *(optional; default = 150 m)*
- Ponding depth *(required)*
- Operational life of the SI *(optional; default = 50 yrs)*
- Depth of SI base below ground surface *(optional; default = 0 m)*
- Sludge thickness *(optional; default = 0.2 m)*

Waste Pile (Figure 5.27)

For WPs, site-specific values for the following parameters may be entered:

- Area of the WP *(required)*
- Distance to nearest well *(optional; default = 150 m)*
- Operational life of the WP *(optional; default = 20 yrs)*
- Depth of the WP base below ground surface *(optional; default = 0 m)*

B. Enter Data Source

For all Tier 2 input parameters for which you enter site-specific values, remember to type in a brief explanation of this value. This information is required and will be included in the printed report.

C. Enter or Select the Distance to the Nearest Surface Water Body

For a SI, you must also either enter a value for the distance to the nearest (permanent) surface water body or choose one of the default selections for this input parameter. This parameter is used in the calculation of ground-water mounding to ensure the model uses a realistic infiltration rate. If you do not know the exact distance to the nearest surface water body, select "unknown" from the drop-down list by clicking on the drop-down list control  to select an approximate distance (i.e., unknown (model uses 360 m); unknown, but less than 2,000 m; unknown, but greater than 2,000 m).

5.5.1.3 Tier 2 Input: Subsurface Parameters (18)

This screen is where you enter site-specific data that describes the subsurface environment at your site.

The subsurface parameters used in IWEM are listed below. You must select the type of subsurface environment at your site from the supplied list. Section 6.2.3.2 provides more information on the subsurface environments. If you have no hydrogeological information for your site, then "unknown" is an available choice. If your list of waste constituents includes any metals, you must also provide a value for the ambient ground-water pH. For the other subsurface parameters, you can provide a site-specific value if you have it, but IWEM will use a default value or distribution of values if you do not have this data.

Subsurface Parameters:

- Subsurface environment *(required, although "unknown" is an available choice)*
- Depth to water table
- Aquifer thickness
- Regional hydraulic gradient
- Aquifer hydraulic conductivity
- Ground-water pH *(required only if a metal is included in the waste constituents)*

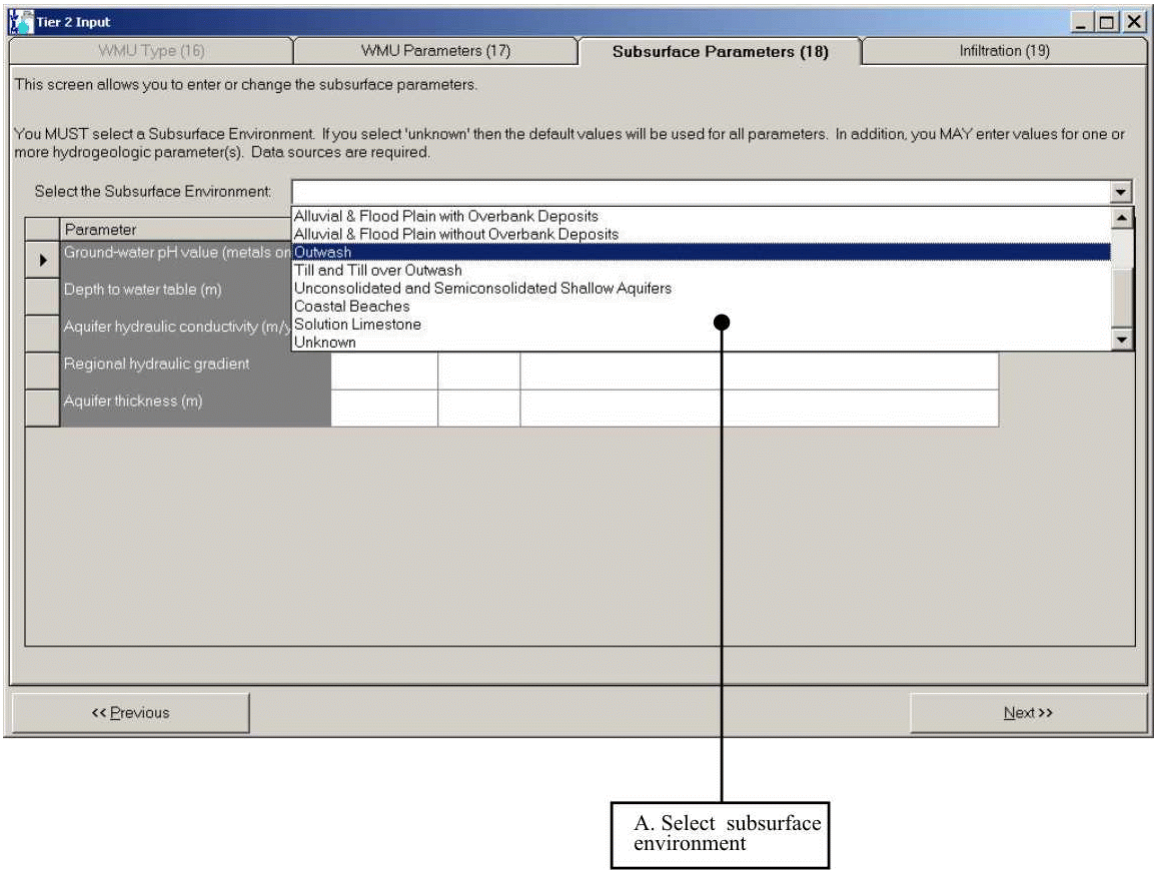

Figure 5.28 Tier 2 Input: Subsurface Parameters (18) - Selecting Subsurface Environment.

The features identified in Figure 5.28 are explained in more detail in the following paragraph.

A. Select Subsurface Environment

IWEM includes twelve different types of subsurface environments that represent different hydrogeological settings. If you do not know what type of environment is appropriate for your site, select "unknown." In effect, the "unknown" subsurface environment is an average of the twelve known environments. You **must** select one of the available subsurface environments. Figure 5.29 presents an example of what this screen will look like if you choose one of the available subsurface environments (the screen appears only slightly different if you set the subsurface environment to "unknown").

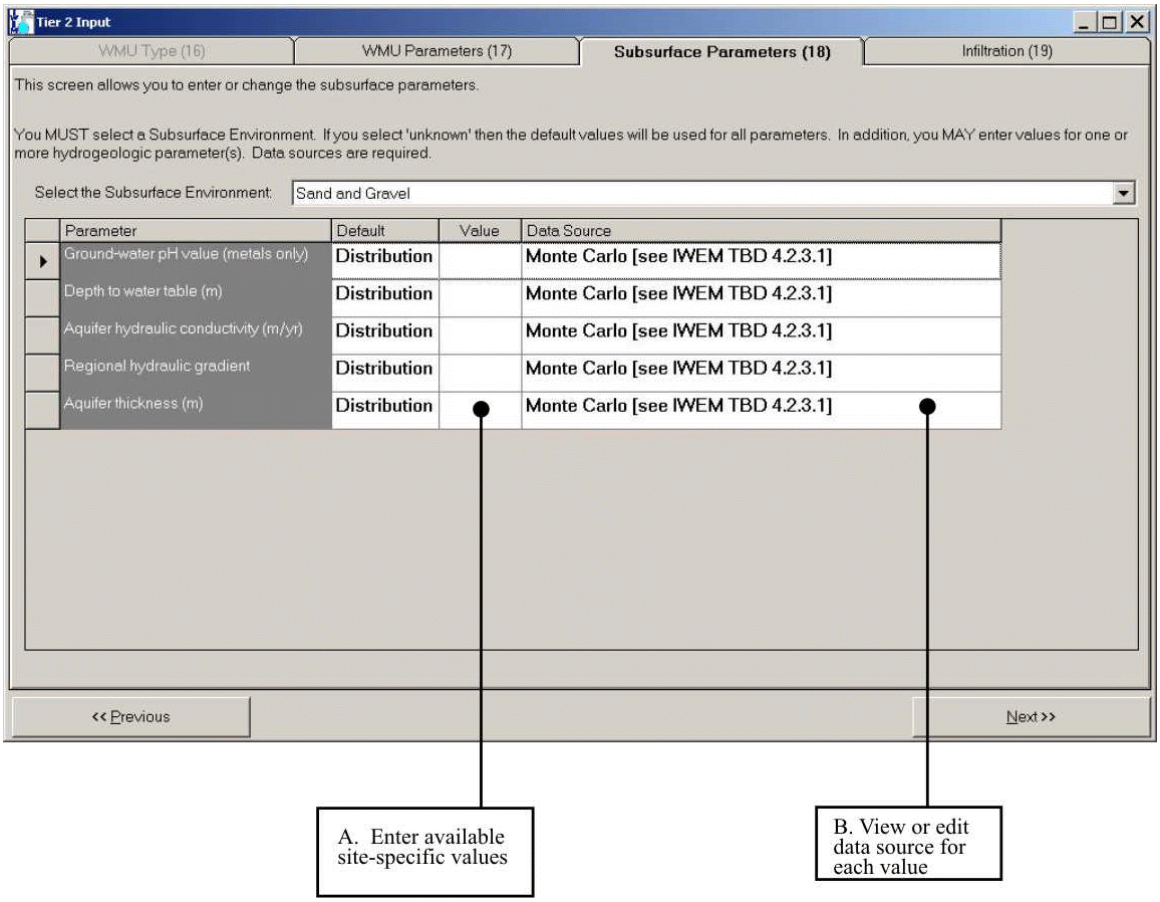

Figure 5.29 Tier 2 Input: Subsurface Parameters (18) - Entering Values of Subsurface Parameters.

The features identified in Figure 5.29 are explained in more detail in the following paragraphs.

A. Enter Available Site-Specific Values

If you select one of the twelve subsurface environments, then screen 18's appearance will be similar to that shown in Figure 5.29. You may enter values for any subsurface parameters for which you have site-specific data. However, you may enter data for only some (but not all) of the parameters and continue with the Tier 2 analysis. In this case, a distribution of parameter values that corresponds to the specified subsurface environment will be used to generate values for any parameter for which you do not enter a site-specific value. The word "Distribution" displayed in the default value column and the phrase "Monte Carlo [see IWEM TBD 4.2.3.1]" in the data source

column indicate that IWEM will randomly select values for this parameter from the appropriate distribution during the Tier 2 analysis process. The distributions reflect the range of values that each parameter can have.

If you do not know the type of subsurface environment beneath your WMU, then you can select the "unknown" subsurface environment. For the unknown subsurface environment, a default value (the one displayed in the default value column) will be used for any input parameter for which you do not enter a site-specific value; that is, the value displayed on the screen will be input to the model as a constant value (no distribution of values is used). Each default value corresponds to the mean value of the available data for that parameter from all twelve subsurface environments. This value is representative of a national average. You may enter values for subsurface parameters that you have site-specific data for. However, if you are lacking data for one or more of the requested parameters for your site, you can still perform a Tier 2 analysis. In this case, the default (displayed) value will be used. The displayed value in the data source column and the phrase "Default [see IWEM TBD 4.2.3.1]" in the data source column indicate that IWEM will use the displayed default value for this input parameter in the Tier 2 analysis.

The subsurface parameters for which you can enter site-specific values are:

- Ground-water pH
- Depth to water table
- Aquifer hydraulic conductivity
- Regional hydraulic gradient
- Aquifer thickness

A site-specific value for ground-water pH is only required if the modeled waste constituents include metals; this parameter is not needed as a user-input for modeling organic constituents.

B. View or Edit Data Source for Each Value

If you select one of the twelve subsurface environments, then for any Tier 2 input parameter that you enter as a site-specific value, you must document the data source or explain the value used. IWEM provides a default data source for all optional data. The default data source is "Monte Carlo [see IWEM TBD 4.2.3.1]" as a reminder that a distribution of values (rather than a single, constant value) is being used for this parameter. All data sources or explanations for default or user-specified data are included in the printed Tier 2 report.

If you select the unknown subsurface environment, then for any Tier 2 input parameter that you enter as a site-specific value, you must document the data source or explain the value used. IWEM provides a data source for all default data. For the "unknown" subsurface environment, the default data source is "Default [see IWEM TBD 4.2.3.1]" as a reminder that a single, constant value (rather than a distribution of values)

> The information provided on screens 17 and 18 completely describes the WMU setting as required by IWEM. When you click |NEXT| on screen 18, IWEM will check your inputs to evaluate whether the setting you have described is physically possible and consistent with the EPACMTP model.
>
> IWEM verifies that:
>
> - the bottom of LFs and WPs are above the water table; and
> - the elevation of ponded water in a SI is higher than the water table elevation.
>
> If you do not specify the depth to ground water, IWEM will postpone this evaluation until screen 19 has been completed. IWEM will notify you if either of the above conditions is violated with a message box informing you of your options. If none of the suggested options is consistent with the conditions at your site, IWEM is not appropriate for your site, and you should consider a Tier 3 analysis. Consult Section 2.3 of this *User's Guide*, or the *IWEM Technical Background Document* (U.S. EPA, 2002c) for more information on the assumptions built into the EPACMTP model which may make it unsuitable for a particular site.

is being used for this parameter. All data sources or explanations for default or user-specified data are included in the printed Tier 2 report.

5.5.1.4 Tier 2 Input: Infiltration (19)

On screen 19 (Figure 5.30), you enter or select the infiltration rate that IWEM will use in modeling your site. The first selection is whether you have site-specific infiltration data, or wish to use IWEM default data if you do not have site-specific data.

In IWEM, infiltration refers to the liquid (leachate) that infiltrates to the subsurface directly below a WMU; recharge refers to the natural precipitation that infiltrates to the subsurface outside the footprint of the WMU.

Choose one of the following options for specifying infiltration rate:

- │YES, I HAVE SITE-SPECIFIC INFILTRATION│ (*i.e.*, a measured, modeled, or calculated value);
- │NO, I DO NOT HAVE SITE-SPECIFIC INFILTRATION│ (the model will estimate values for you based on the selected soil type (or waste type permeability, for WPs) and geographic location of the WMU site).

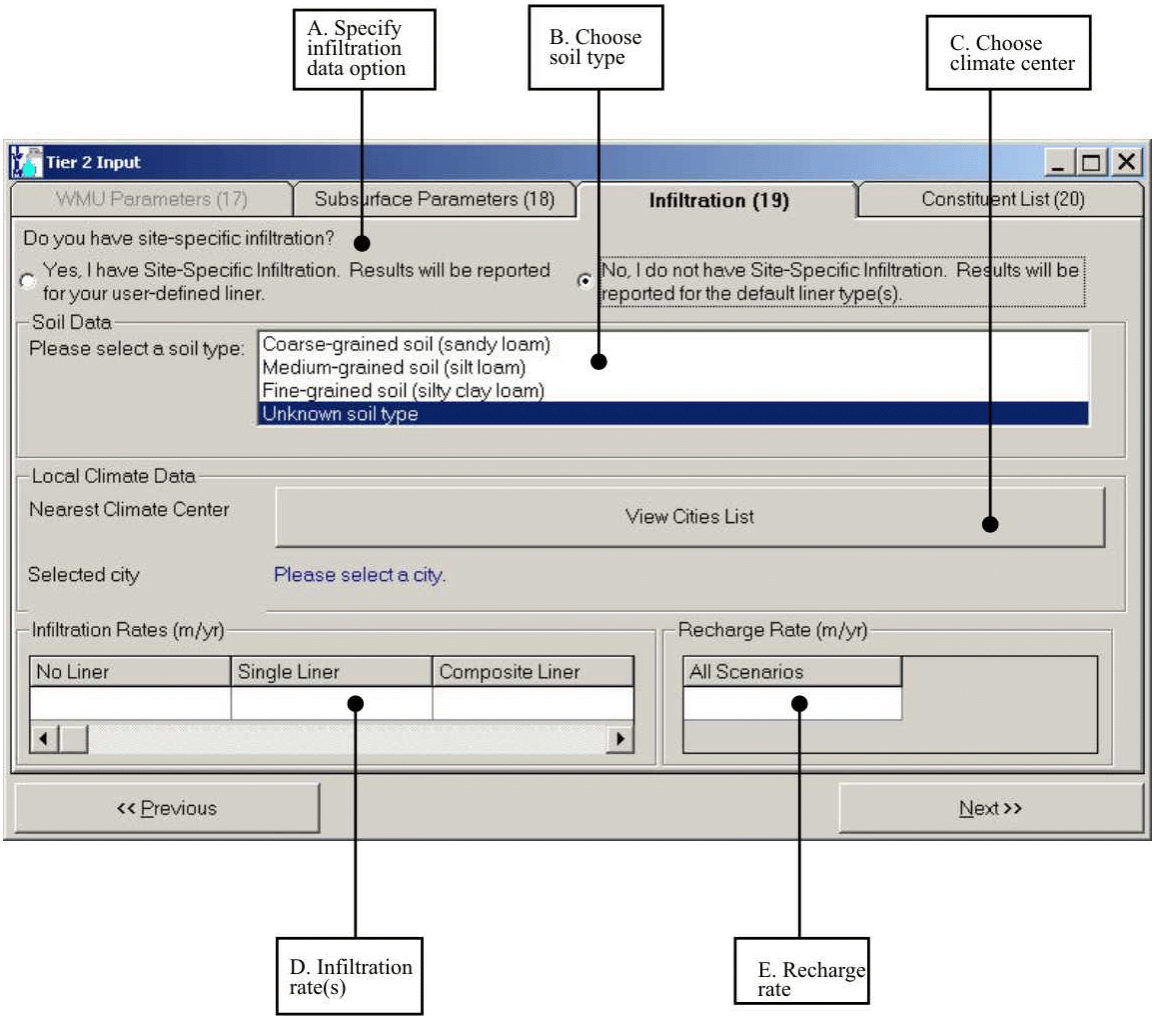

Figure 5.30 Tier 2 Input: Infiltration (19) - Initial Appearance.

At its initial appearance (with the NO, I DO NOT HAVE SITE-SPECIFIC INFILTRATION radio button selected by default), screen 19 will generally appear like Figure 5.30 (although this screen can be slightly different depending upon the selected WMU type).

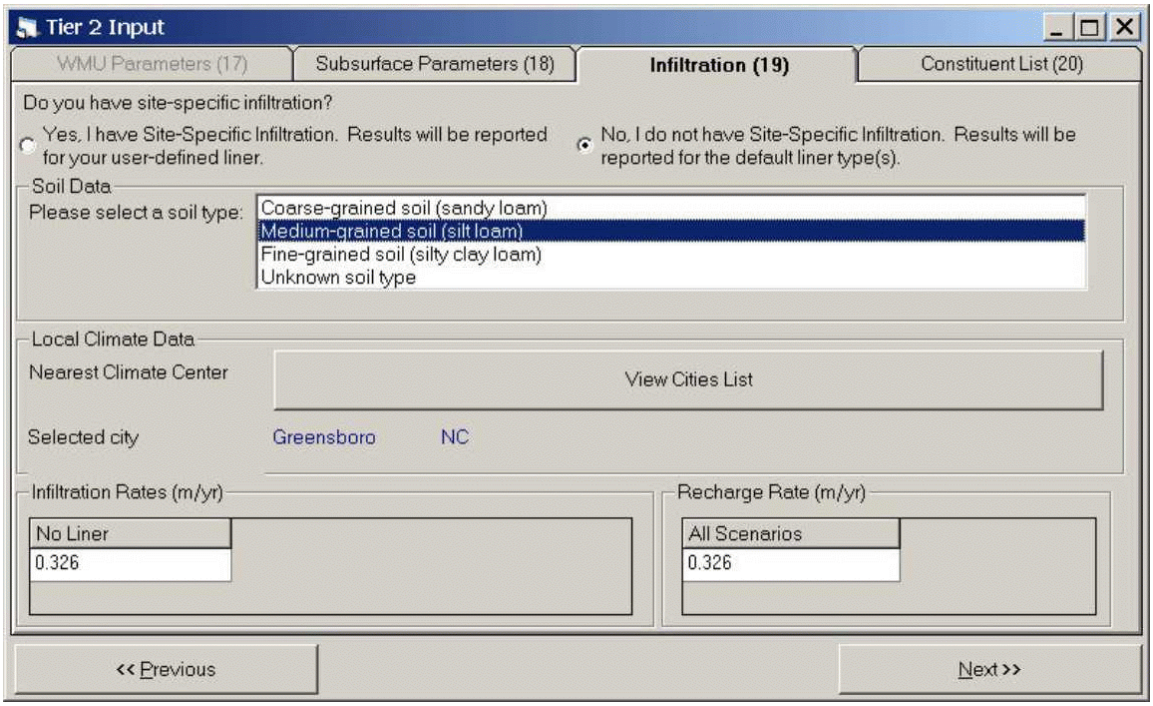

Figure 5.31 Tier 2 Input: Infiltration (19) - Land Application Unit.

If you do not have a site-specific value for infiltration, once you have selected a soil type (or waste type permeability, for waste piles) and climate center, screen 19 will appear like one of the screens presented in Figures 5.31 through 5.34 depending on the WMU type you have selected.